FIGURE 1

20

24

26

h

28

12

D

D

15

14

22

FIGURE 2

50 — DEPOSIT PHOTORESIST ONTO SUBSTRATE

52 — HEAT THE COATED SUBSTRATE

54 — COOL THE HEATED SUBSTRATE

56 — EXPOSE SUBSTRATE TO HOLOGRAPHICALLY GENERATED INTERFERENCE PATTERN

58 — DEVELOP EXPOSED LATENT IMAGE IN THE PHOTORESIST

60 — SPIN DRY PHOTORESIST

62 — EXPOSE DRY PHOTORESIST TO UVA LIGHT FIRST THAN UVC LIGHT FOR 10 TO 15 MINUETS FOR EACH EXPOSURE

64 — HEAT UVA AND UVC EXPOSED PHOTORESIST FOR AT LEAST 30 MINUTES AT A TEMPERATURE OF 110° TO 150° C

65 — SUBJECT PHOTORESIST TO A TEMPERATURE OF 85°C AND 85% RH FOR 8 TO 16 HOURS

FIGURE 3

FIGURE 4

Grating Diffraction Efficiency - %

λ/D Ratio

→ S Polarization → P Polarization

82

86

88

10
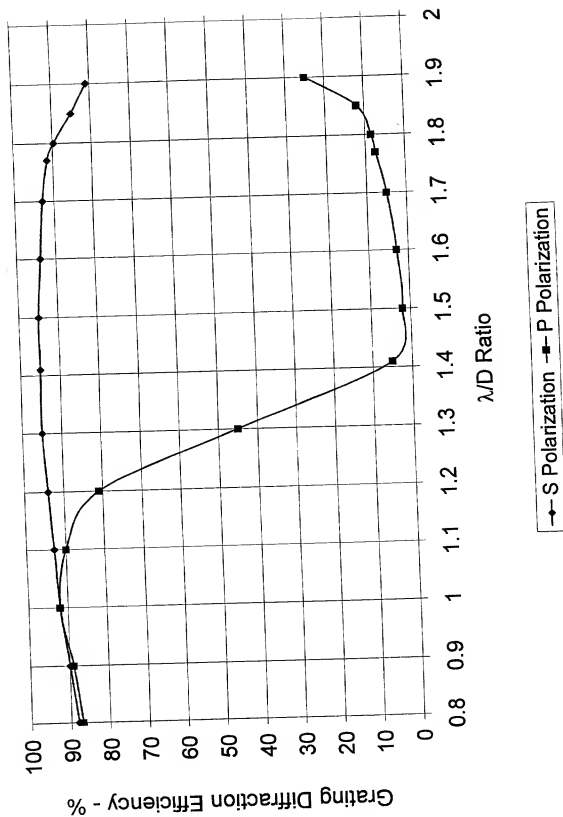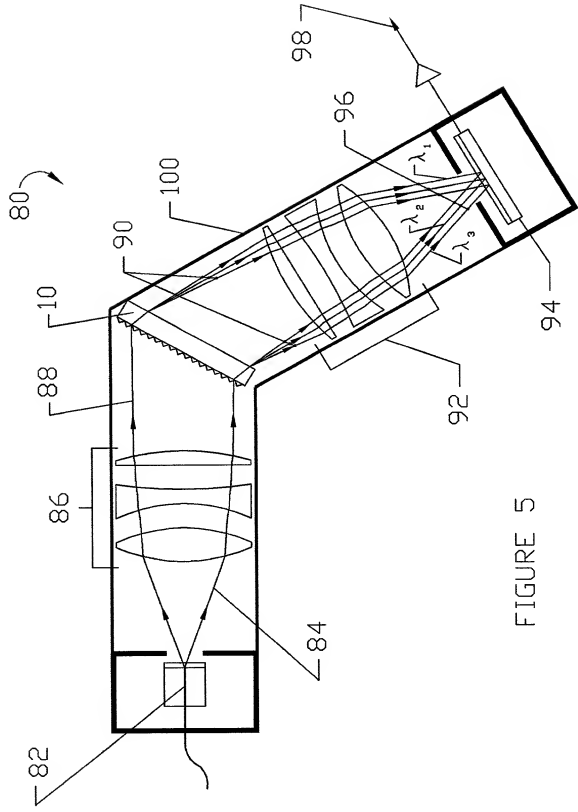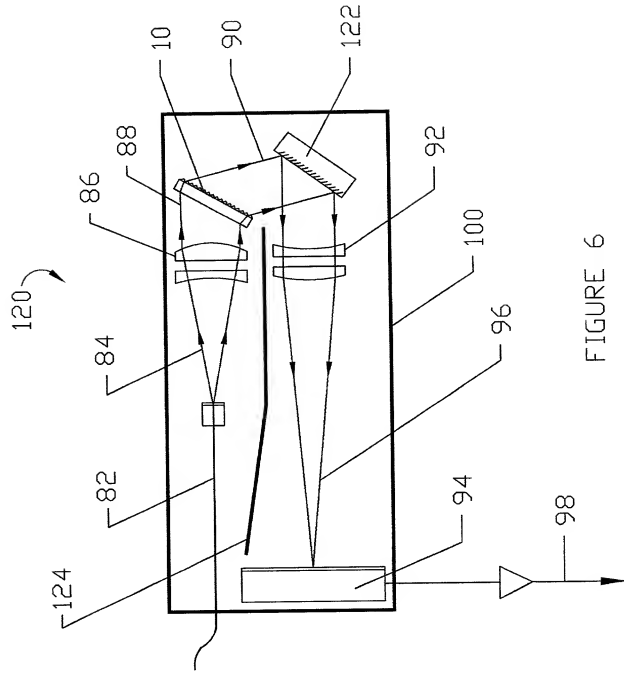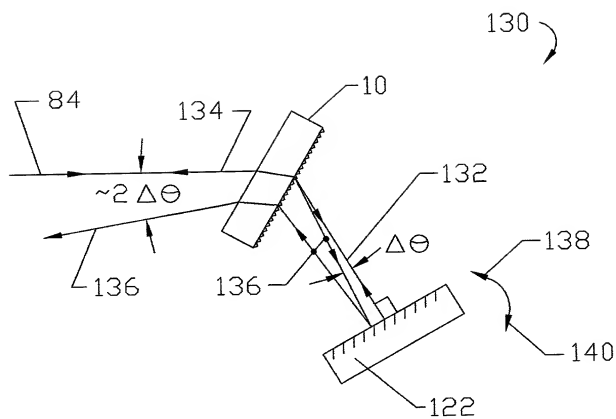
90

80

100

96

98

84

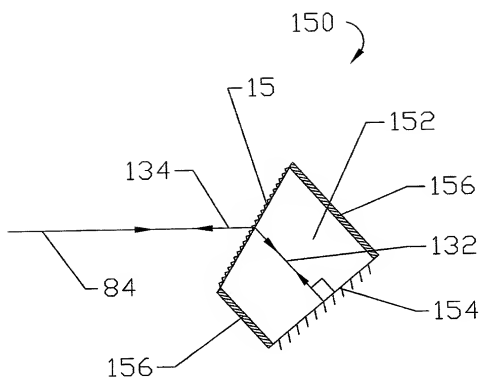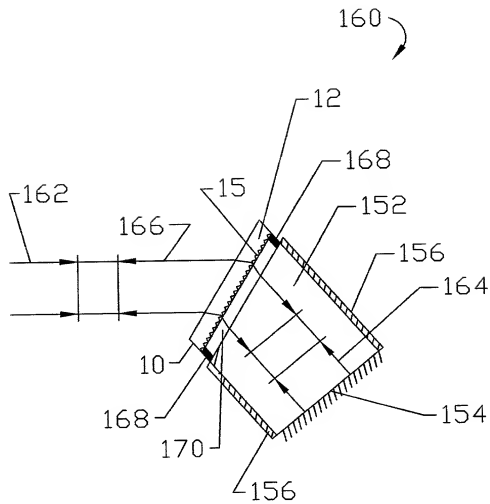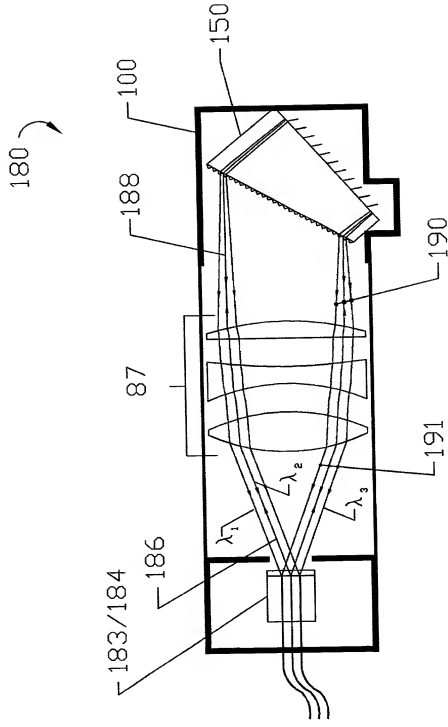λ_1

λ_2

λ_3

94

92

FIGURE 5

FIGURE 6

FIGURE 7

FIGURE 8

FIGURE 9

FIGURE 10A

FIGURE 10B

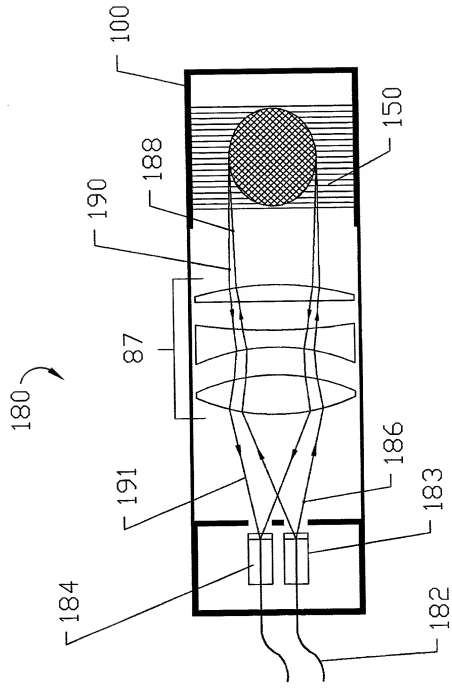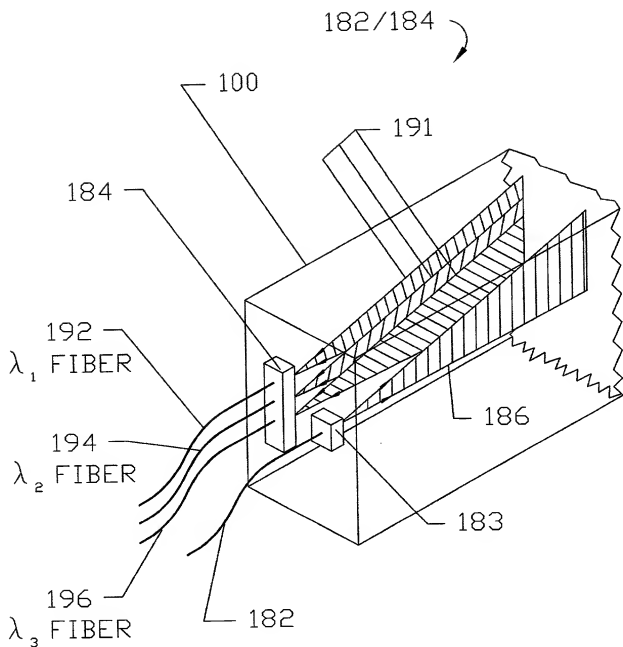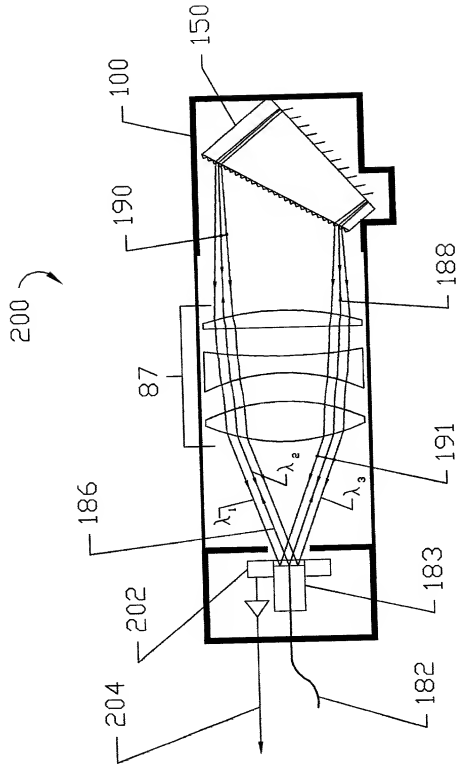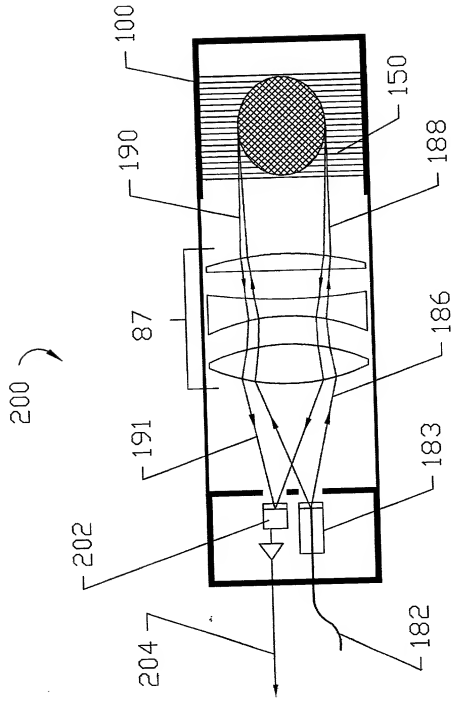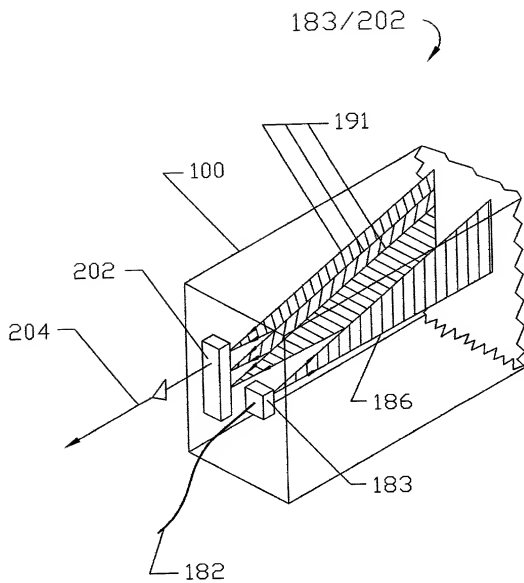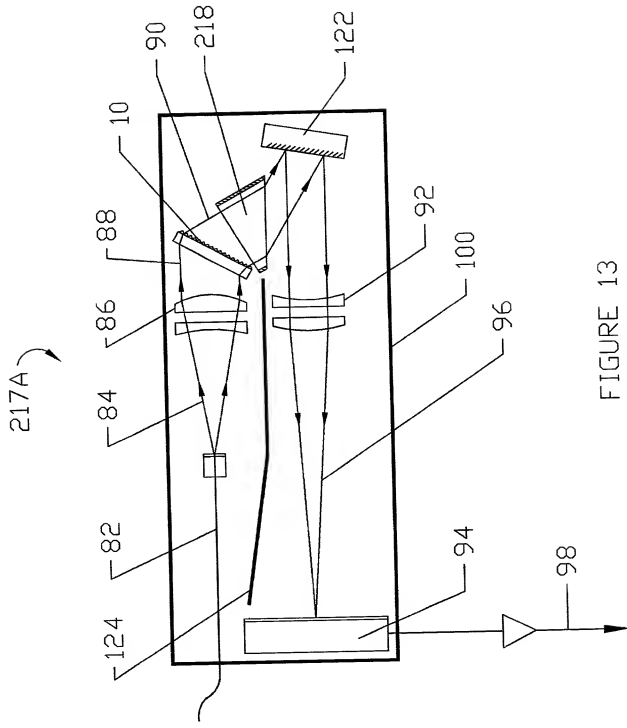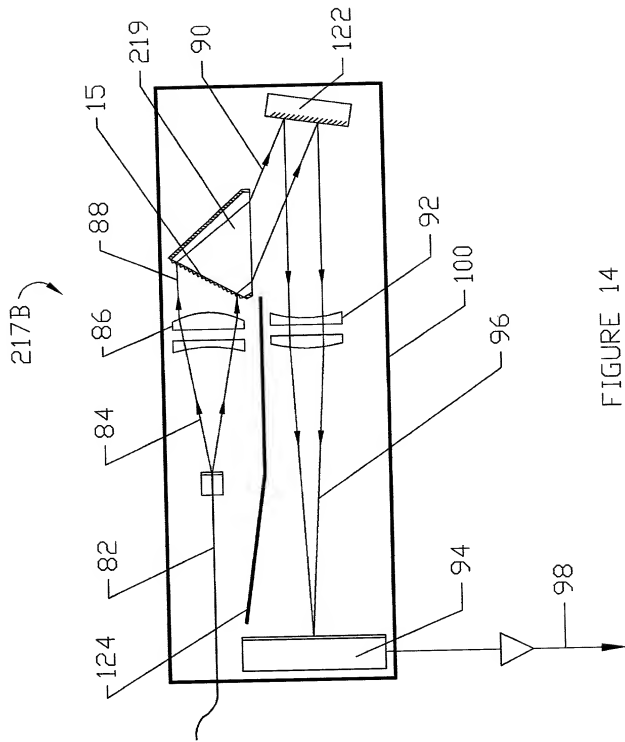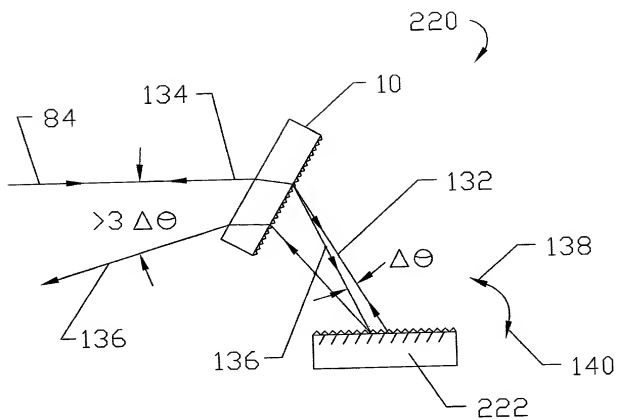182/184

100

191

184

192
λ_1 FIBER

194
λ_2 FIBER

186

183

196
λ_3 FIBER

182

FIGURE 10C

FIGURE 11A

FIGURE 11B

183/202

191
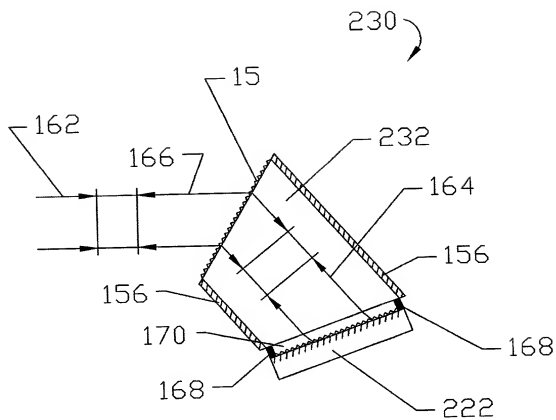
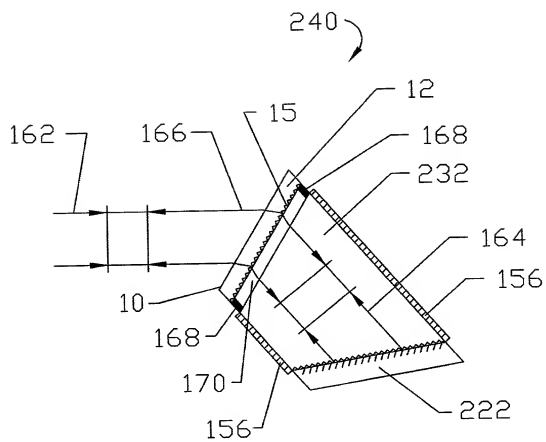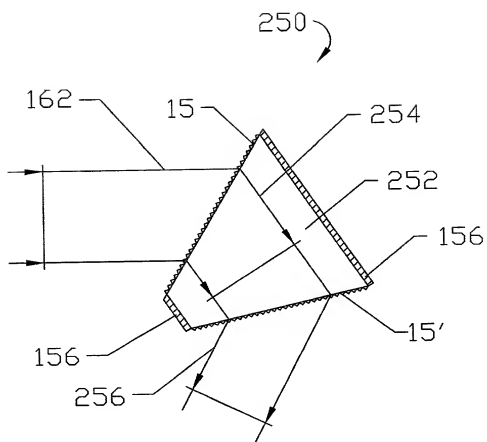100

202

204

186

183

182

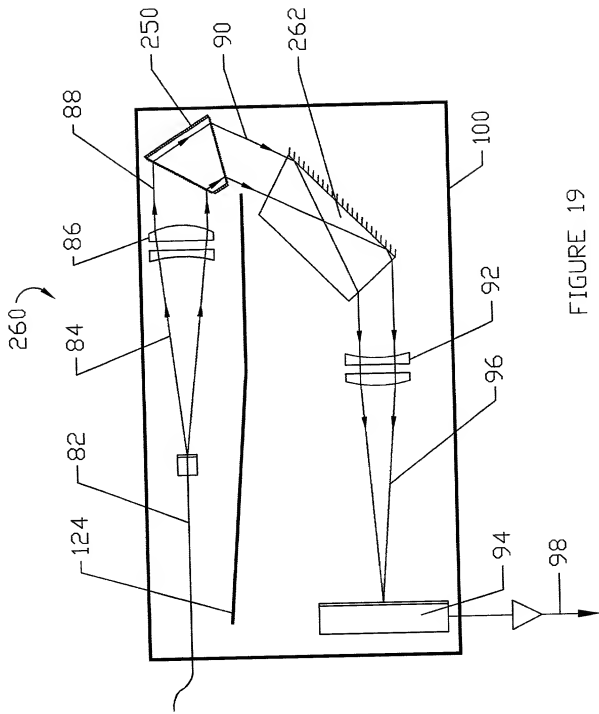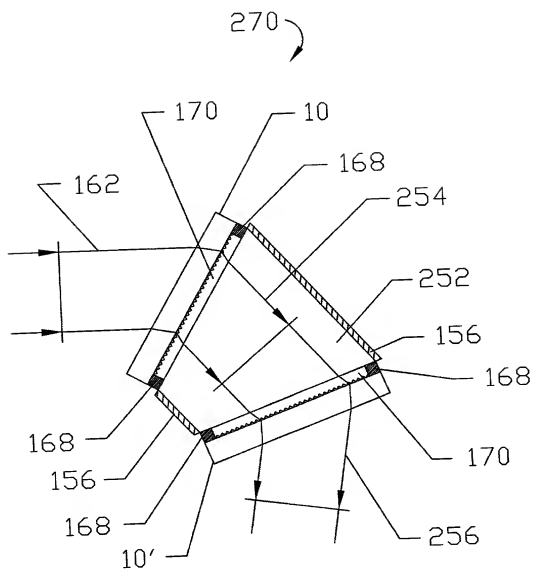FIGURE 11C

FIGURE 12

FIGURE 13
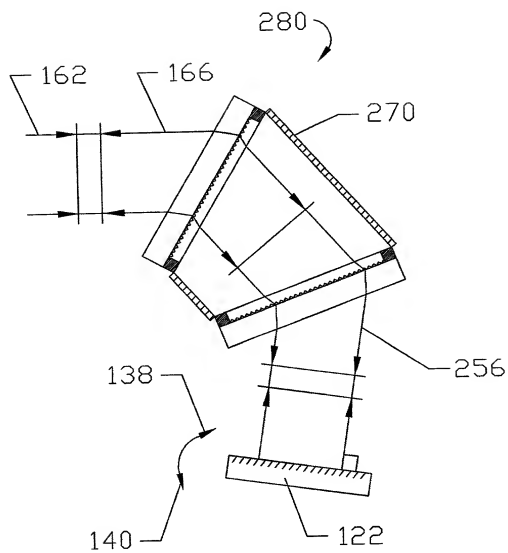
FIGURE 14
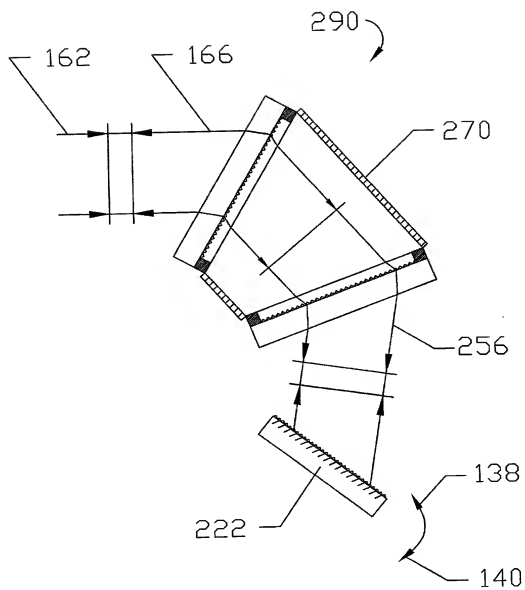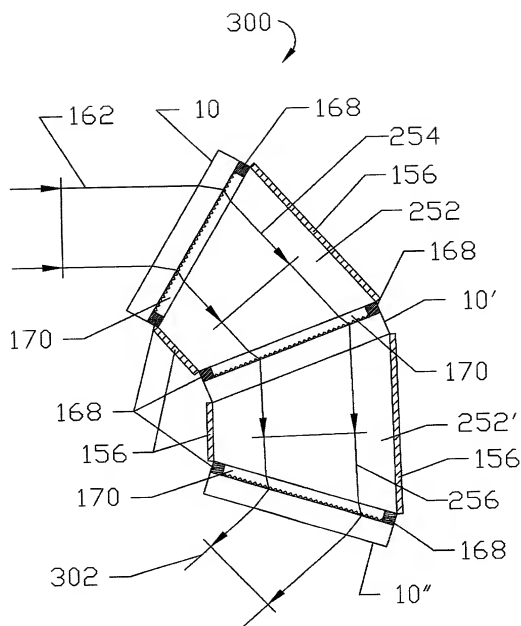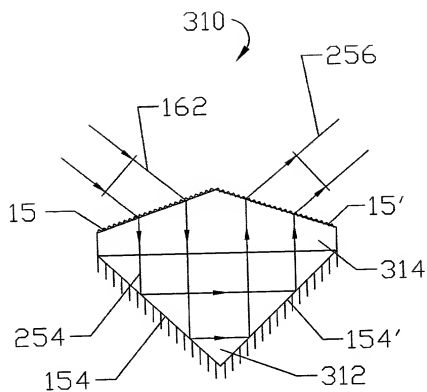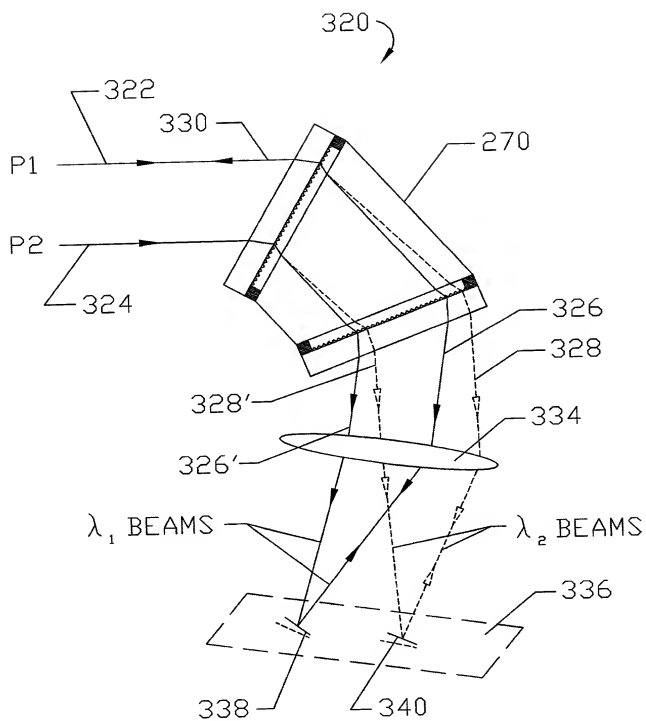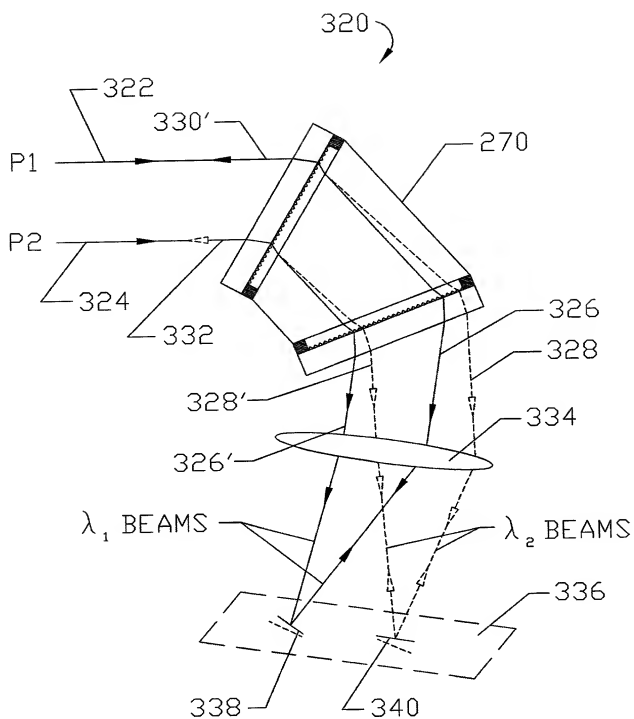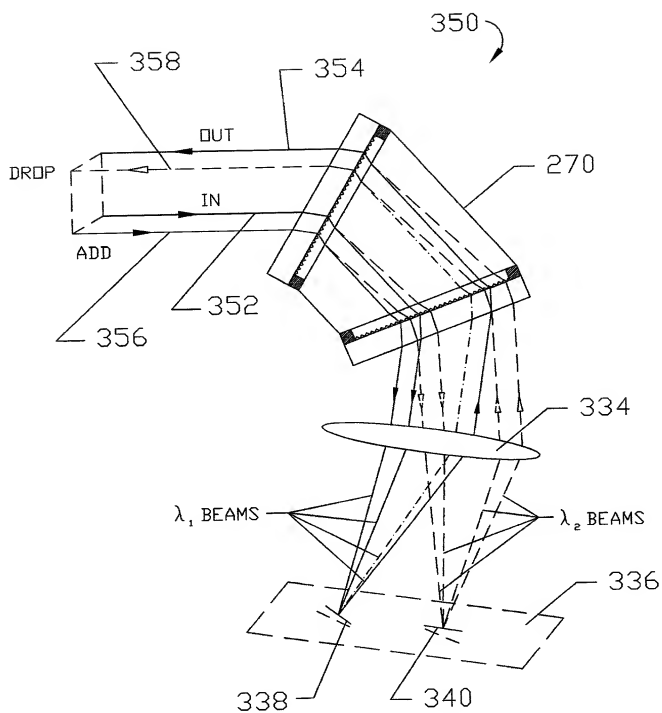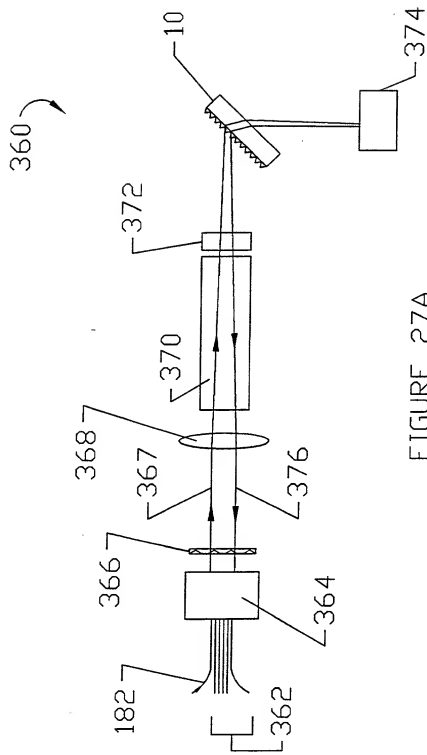
FIGURE 15

FIGURE 16

FIGURE 17

FIGURE 18

FIGURE 19

FIGURE 20

FIGURE 21

FIGURE 22

FIGURE 23

FIGURE 24

FIGURE 25A

320

322
330'
P1
270
P2
324
332
326
328
328'
326'
334
λ_1 BEAMS
λ_2 BEAMS
336
338
340

FIGURE 25B

350

358

354

270

OUT

DROP

IN

ADD

352

356

334

λ_1 BEAMS

λ_2 BEAMS

336

338

340

FIGURE 26
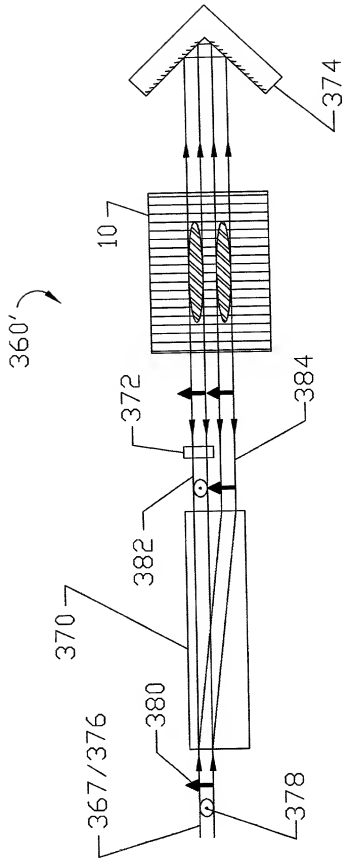
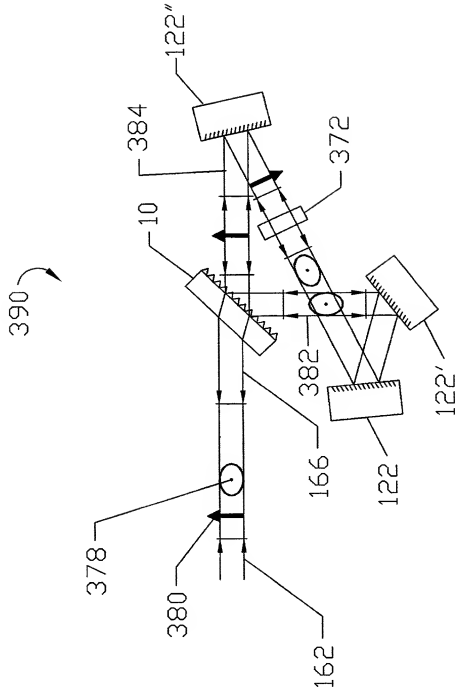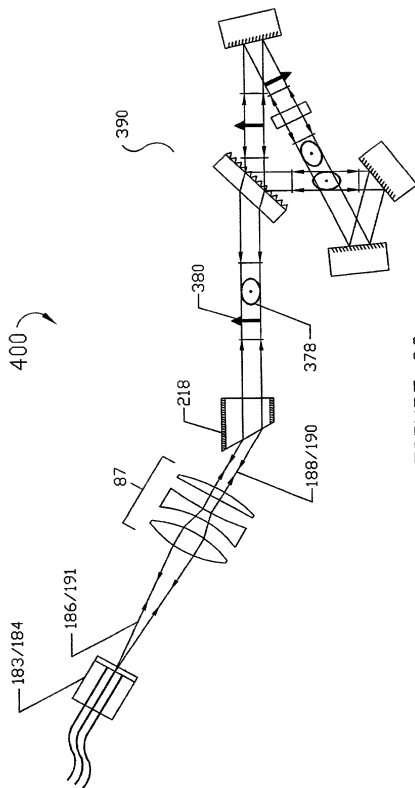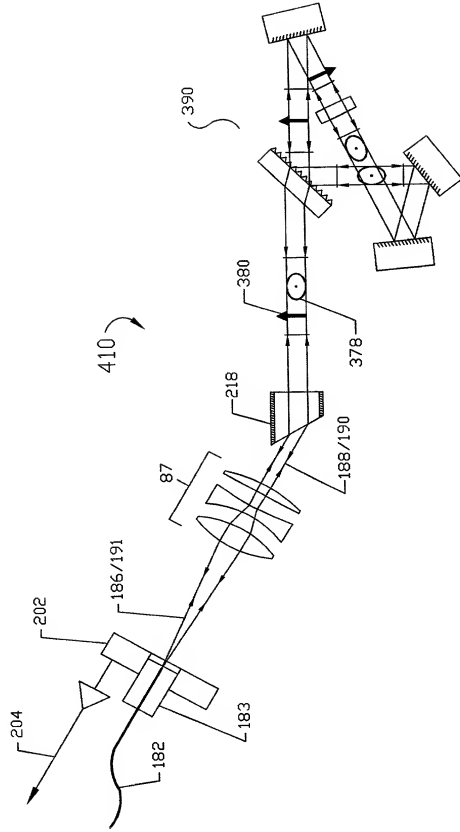FIGURE 27A

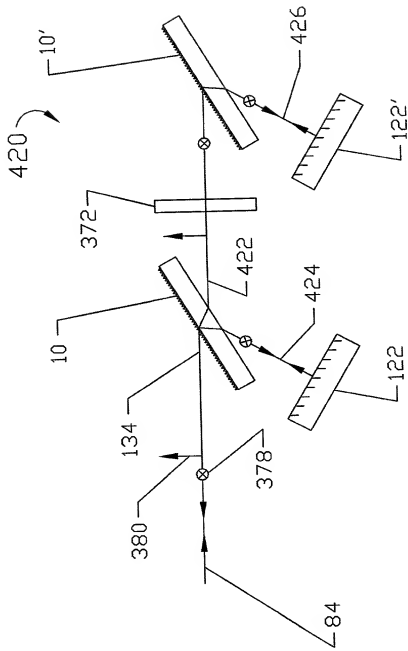360'

10

372

382

384

370

380

367/376

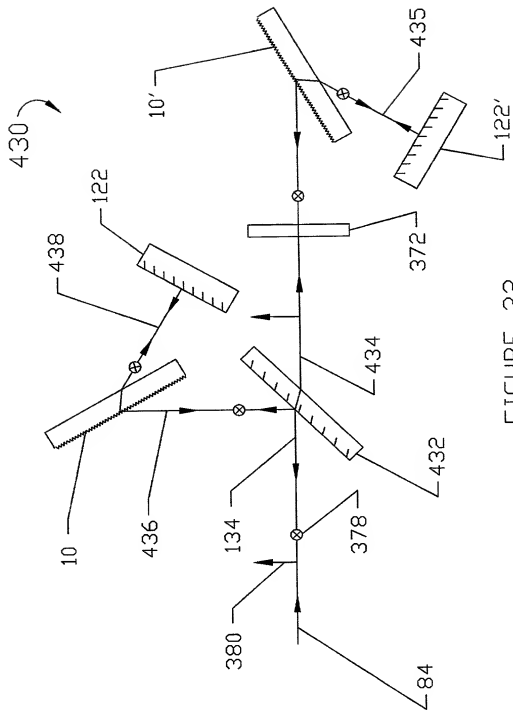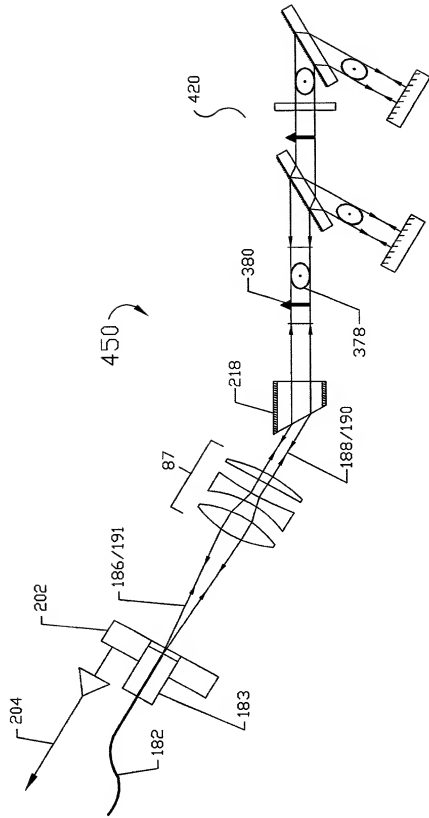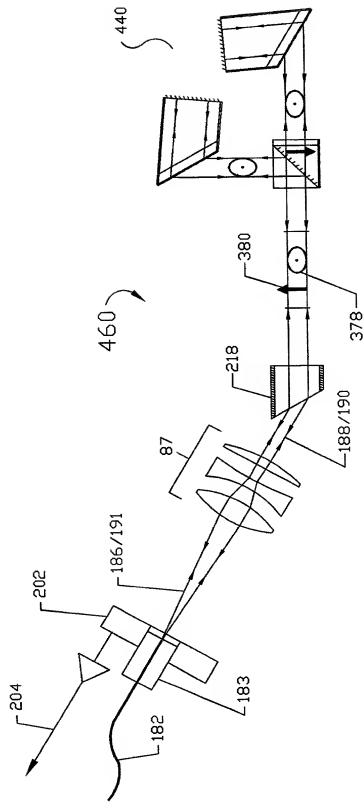378

374

FIGURE 27B

FIGURE 28

FIGURE 29

FIGURE 30

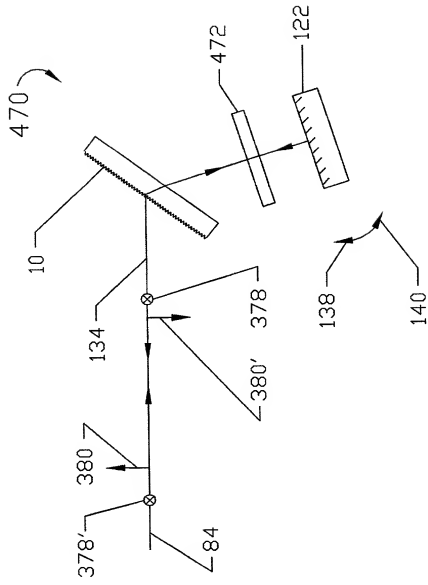FIGURE 31

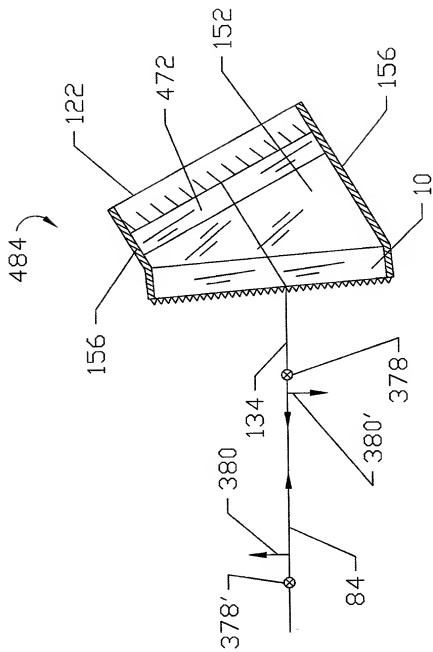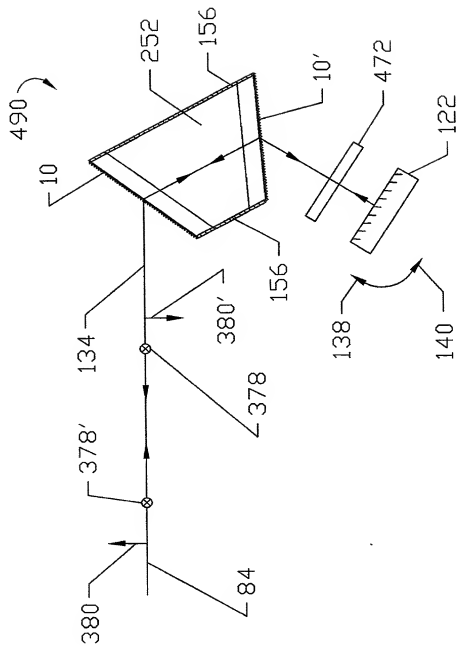FIGURE 32

FIGURE 33
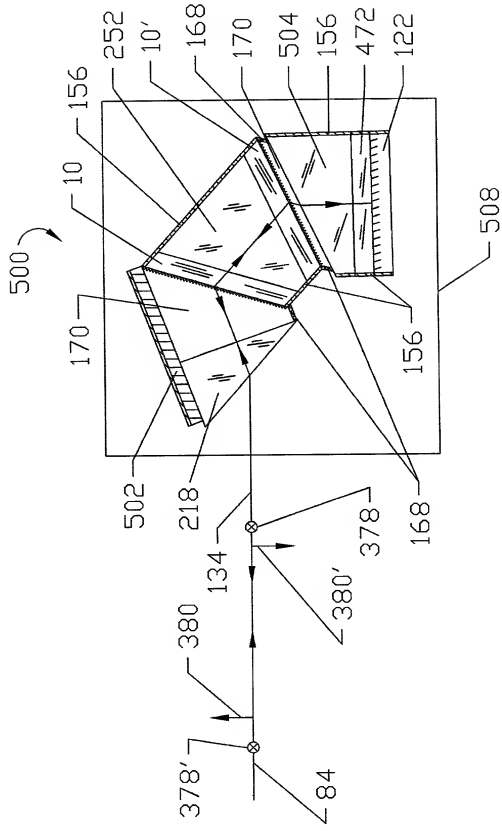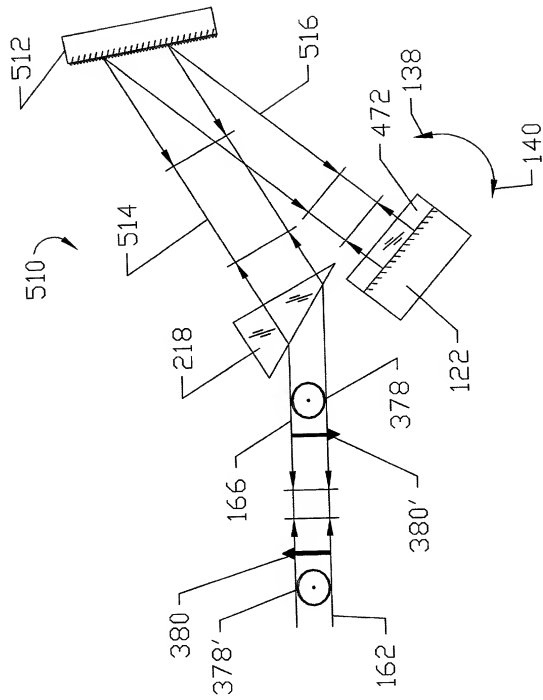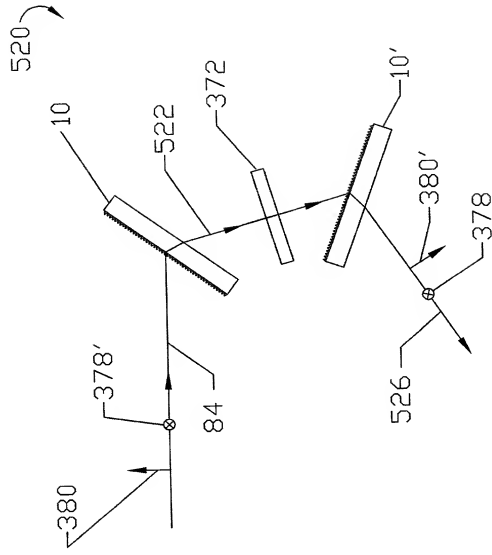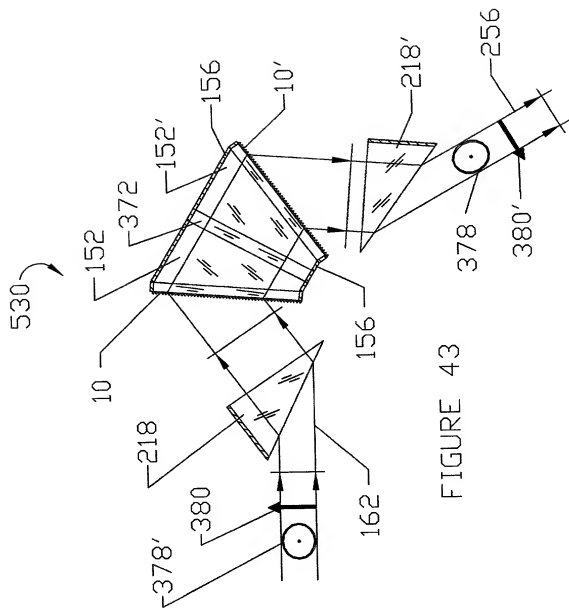
FIGURE 34

FIGURE 35

FIGURE 36

FIGURE 37

FIGURE 38A

FIGURE 38B

FIGURE 39

FIGURE 40

FIGURE 41

FIGURE 42

FIGURE 43

FIGURE 44

550

484

218

188/190

87

156

554

186

182

552

183

191

202

204

FIGURE 45

FIGURE 46A

560
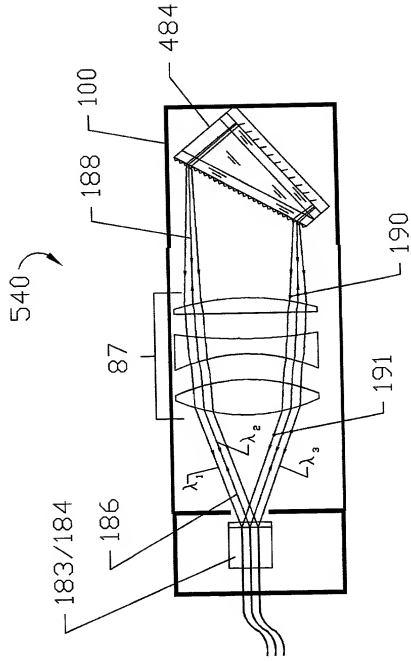
484

218

186

552

183

182

204

87

508

566

191

564

202

100

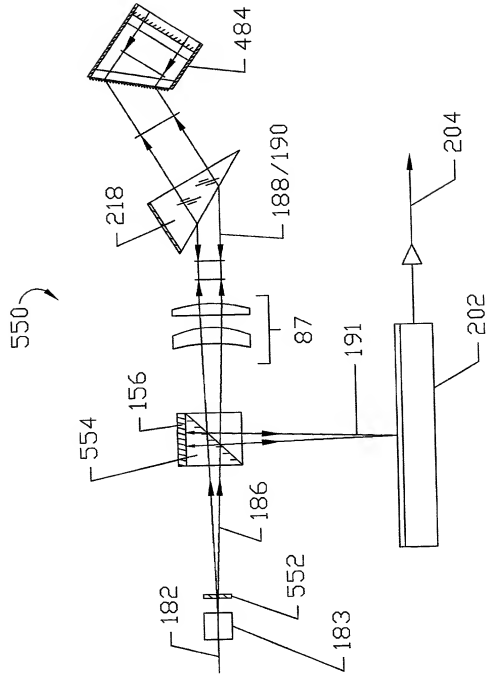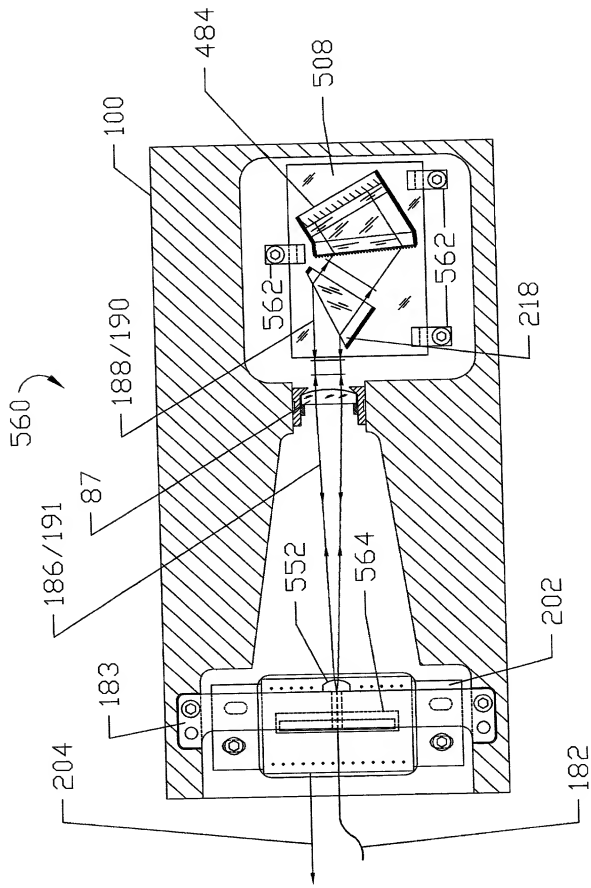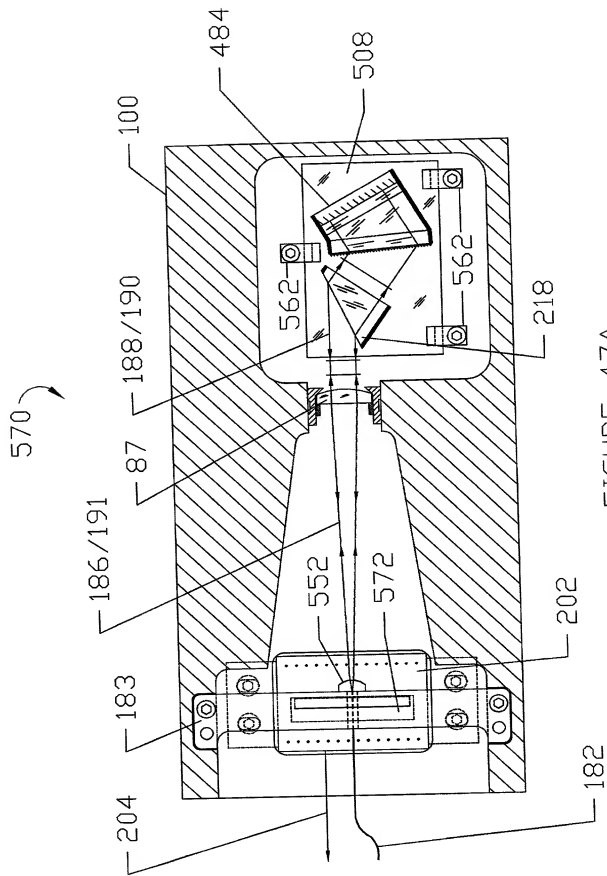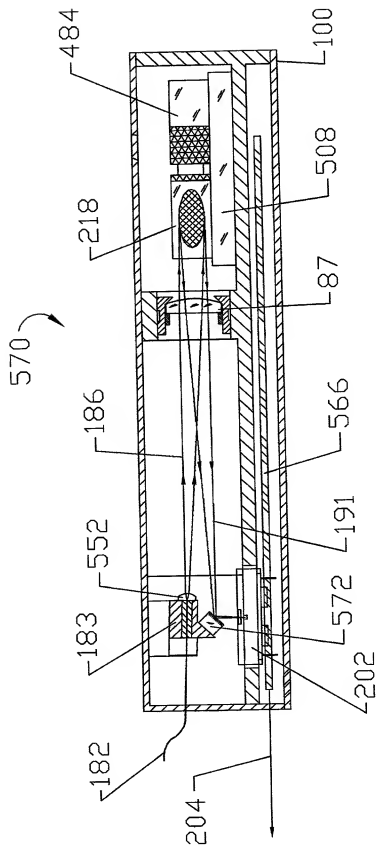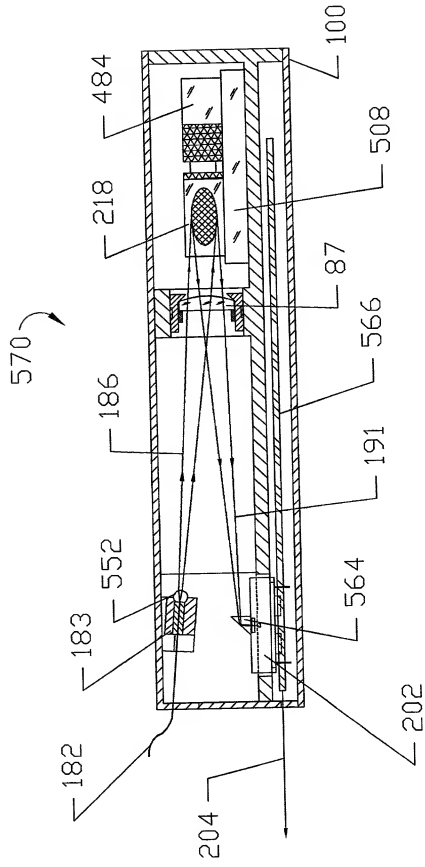FIGURE 46B

FIGURE 47A

FIGURE 47B

FIGURE 48
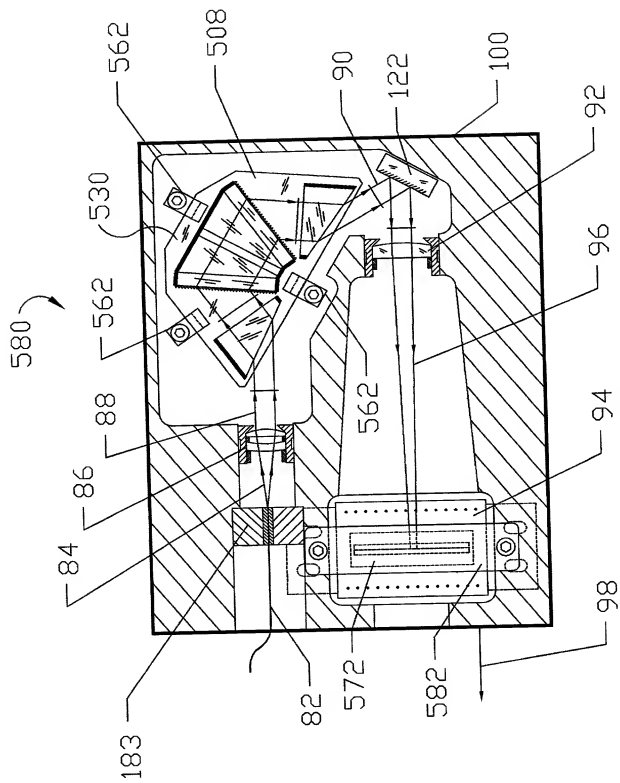
FIGURE 49A

FIGURE 49B

FIGURE 49C

590

322
330
P1
270
P2
324
326
328
328'
472
326'
334
λ₁ BEAMS
λ₂ BEAMS
336
338
340

FIGURE 50

FIGURE 51

FIGURE 52

FIGURE 53

630

10

218'

618/620

122

218

372

370

186/191

87

616

188/190

183

614

611

612

618

622/624

334
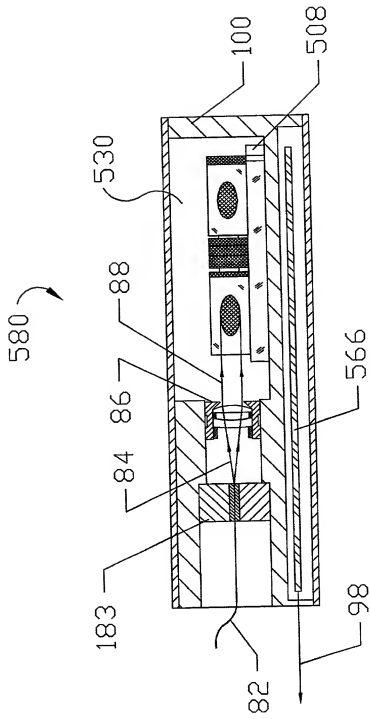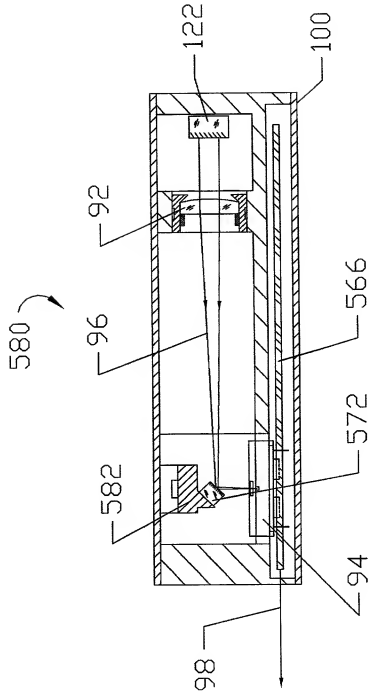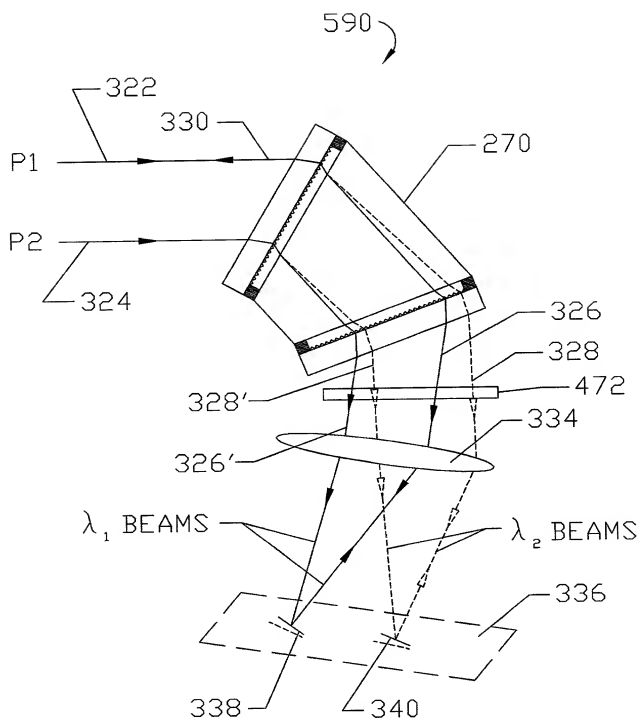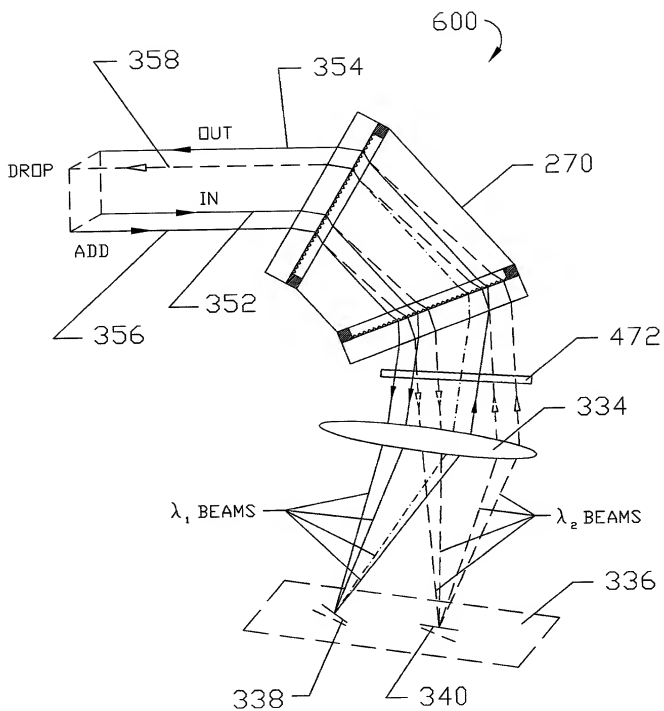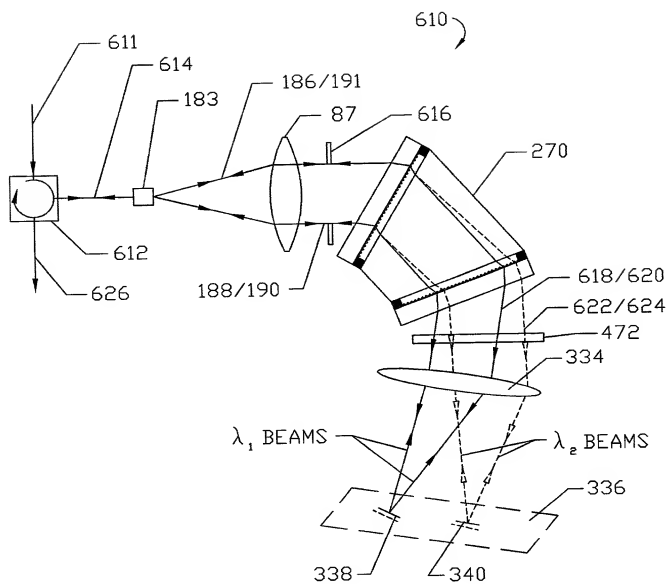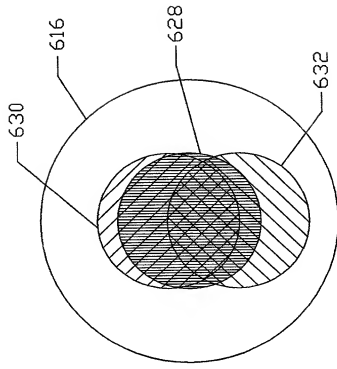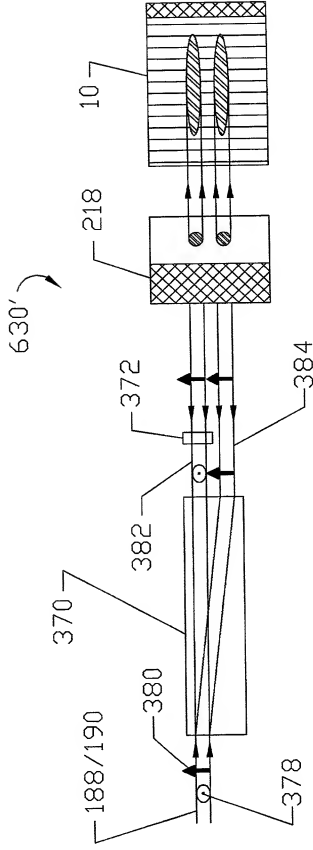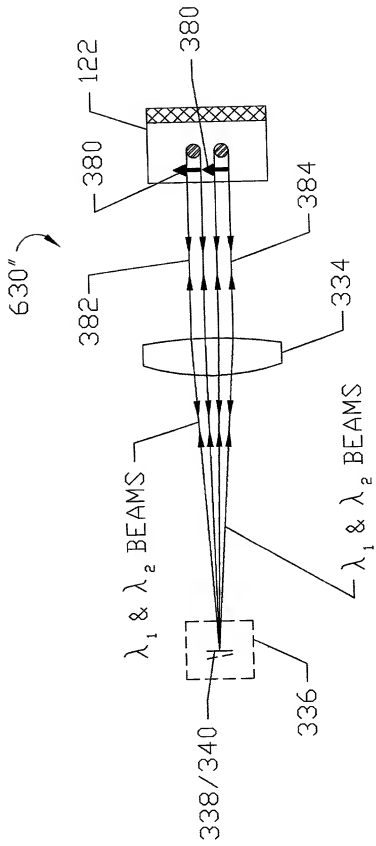
λ_1 BEAMS

λ_2 BEAMS

336

338

340

FIGURE 54A

FIGURE 54B

FIGURE 54C

FIGURE 55A

FIGURE 55B

FIGURE 56